

What is claimed is:

1. A system for generating power from fluid flow in a wellbore comprising:  
a rotation member having a passageway through which objects may pass into the wellbore; and  
a support mechanism coupling the rotation member inside the wellbore;  
wherein fluid flow through the passageway of the rotation member causes the rotation member to rotate thereby generating a magnetic field that produces usable power.
2. The system of claim 1 wherein said rotation member is a rotor.
3. The system of claim 2 wherein said rotor is ring-shaped.
4. The system of claim 2 wherein said rotor comprises two semi-circular arches.
5. The system of claim 1 wherein said support mechanism comprises first and second braces coupled to opposing sides of said rotating member, said first and second braces including bearings engaged with said rotating member for facilitating the rotation of said rotation member.
6. The system of claim 5 wherein said first and second braces hold said rotation member about an axis of rotation substantially perpendicular to the lengthwise axis of said wellbore.
7. The system of claim 1 wherein the rotation member comprises arched and semi-circular arms that join at said support mechanism.

8. The system of claim 1 wherein rotation member has magnetic properties
9. The system of 8 further comprising magnets coupled to said rotation member to provide said magnetic properties.
10. The system of claim 8 further comprising magnetic pickups positioned about the rotation member within the wellbore and configured to sense the magnetic properties of the rotation member as fluid causes it to rotate within said wellbore and thereby transform the rotating action of the rotation member into electrical energy.
11. The system of claim 10 further comprising:  
a power conditioning unit; and  
leads extending from the magnetic pickups to the power conditioning unit such that a magnetic field generated by the rotational motion of the rotation member induces a current within the leads that is received by the power conditioning unit.
12. The system of claim 11 wherein said power conditioning unit comprises a rectifier circuit for controlling the characteristics of electrical energy generated by the rotation member.
13. The system of claim 12 further comprising:  
an output terminal coupled to the power conditioning unit; and  
a lead coupled to the output terminal and adapted for transmitting power to a component requiring power within the wellbore.

14. The system of claim 11 wherein the power conditioning unit comprises one or more batteries.
15. The system of claim 11 wherein the power conditioning unit comprises a capacitive bank.
16. The system of claim 11 wherein the power conditioning unit comprises a fuel cell.
17. The system of claim 1 further comprising a starter rotor coupled to the rotation member and configured to assist the rotation of the rotation member within the wellbore.
18. The system of claim 17 wherein the starter rotor comprises a pair of offset and curved drag members which provide resistance to fluid flow within the wellbore and thereby facilitate rotation of the rotation member along the direction of fluid flow within the wellbore.
19. The system of claim 1 further comprising a control adapted for activating the rotation member within the wellbore.
20. The system of claim 19 wherein the control further comprises:  
a motor for starting and stopping the rotation of the rotation member; and  
a control lead extending from outside the wellbore to the motor for allowing human operation of the motor from a point outside the wellbore.

21. The system of claim 20 wherein the motor is further capable of controlling the speed of rotation of the rotation member within the wellbore.

22. A power generating system for a oil producing operation having production tubing in a downhole wellbore, the system comprising:

a magnetized rotation member coupled to the wellbore within the production tubing, the rotation member having a passageway through which objects may be passed within the production tubing;

a support mechanism coupling the rotation member to the production tubing and allowing the rotation of the rotation member within the production tubing;

magnetic pickups predisposed about the rotation member within the wellbore;

a power conditioning unit; and

leads extending from the magnetic pickups to the power conditioning unit;

wherein the flow of fluid through the production tubing causes the rotation member to rotate and induce a magnetic field on the magnetic pickups such that electrical energy is produced and delivered to the power conditioning unit, the power conditioning unit capable of delivering usable power to any one of several electronic components within the wellbore.

23. The power generating system of claim 22 wherein said power conditioning unit further comprises a rectifier circuit.

24. The power generating system of claim 22 further comprising a starter rotor coupled to the rotation member and configured to assist the rotation of rotation member within the wellbore.

25. The power generating system of claim 24 wherein the starter rotor comprises a pair of offset and curved and curved drag members which provide resistance to fluid flow within the wellbore and thereby facilitate rotation of the rotation member along the direction of fluid flow within the production tubing.
26. The power generating system of claim 22 further comprising:  
a motor for starting and stopping the rotation of the rotation member; and  
a control wire extending from outside the wellbore to the motor for allowing human operation of the motor from a point outside the wellbore.
27. The power generating system of claim 26 wherein the motor is further capable of controlling the speed of rotation of the rotation member within the wellbore.
28. The power generating system of claim 22 further comprising magnets coupled to the rotation member and positioned to pass through the flux area of the magnetic pickups such that rotation of the rotation member induces a magnetic field on the magnetic pickups.
29. The power generating system of claim 22 further comprising:  
an output terminal coupled to the power conditioning unit; and  
leads coupled to the output terminal and adapted for transmitting power to a component requiring power within the wellbore.
30. The power generating system of claim 22 wherein the conditioning unit comprises batteries.

31. The power generating system of claim 22 wherein the power conditioning unit comprises a capacitive bank.
32. The power generating system of claim 22 wherein the power conditioning unit comprises a fuel cell.
33. The power generating system of claim 22 wherein said power conditioning unit comprises a DC-to-DC converter circuit for delivering a stable DC voltage.
34. A system for extracting fluids from a plurality of production zones intersected by a wellbore, the system including downhole power generation and comprising:  
production tubing extending along a substantial length of the wellbore, the production tubing including at least one valve at each of the plurality of production zones with passages extending from the production zones to each valve permitting the flow of fluid from the plurality production zones into the production tubing via the valve; and  
at least one magnetized rotation member coupled within the production tubing and predisposed to make contact with fluid flowing through the production tubing as a valve opens to permit fluid to flow from a production zone, the rotation member having a passageway through which objects may pass into the wellbore via the production tubing, wherein fluid flow through the passageway causes the rotation member to rotate thereby generating a magnetic field that produces useable power.
35. The system of claim 34 further comprising an rotation member at each production zone intersected by the wellbore.

36. The system of claim 34 further comprising first and second braces coupling the rotation member to the production tubing, the first and second braces including bearings for facilitating rotation of the rotation member within the production tubing.

37. The system of claim 36 wherein said first and second braces hold the rotation member about an axis of rotation substantially perpendicular to the lengthwise axis of the wellbore;

38. The system of claim 34 further comprising magnetic pickups positioned within the wellbore about the rotation member and configured to translate the rotational motion of the rotation member into electric energy.

39. The system of claim 34 further comprising:  
a power conditioning unit; and  
leads extending from the magnetic pickups to the power conditioning unit such that a magnetic field generated by the rotation member induces a current within the leads that is received by the power conditioning unit.

40. The system of claim 39 wherein said power conditioning unit further comprises a rectifier circuit for controlling the characteristics of the power generated by the rotation member.

41. The system of claim 39 further comprising:  
an output terminal coupled to the power conditioning unit; and  
leads coupled to the output terminal and adapted for transmitting power to a component within the wellbore requiring power.

42. The system of claim 34 further comprising multiple rotation members coupled within the production tubing.

43. The system of claim 42 wherein said multiple rotation members are connected serially.

44. The system of claim 42 wherein said multiple rotation members are connected in parallel.

45. The system of claim 34 further comprising a starter rotor coupled to the rotation member and configured to assist the rotation of the rotation member within the wellbore.

46. The system of claim 45 wherein the starter rotor further comprises a pair of offset and curved drag pieces which provide resistance to fluid flow within the wellbore and thereby facilitate rotation of the rotation member along the direction of fluid flow within the wellbore.

47. The system of claim 34 further comprising a means of controlling the rotation of the rotation member within the wellbore.

48. The system of claim 47 wherein the means of controlling further comprises:

- a motor for starting and stopping the rotation of the rotation member; and
- a control lead extending from outside the wellbore to the motor for allowing human operation of the motor from a point outside the wellbore.



49. The system of claim 48 wherein the motor is further capable of controlling the speed of rotation of the rotation member.

2001-IP-004331